# Department for Public Health
# Childhood Lead Poisoning Prevention Program

According to the CDC, childhood lead poisoning is still considered to be the most preventable environmental disease of young children. Yet an estimated 310,000 children in the United States have elevated blood lead levels (EBLL's), 10-14 micrograms per deciliter (µg/dL). Lead poisoning can affect nearly every system in the body. A simple blood test can prevent a lifetime of irreversible effects on the body.

Children can be exposed to lead from many sources. The primary source of lead exposure among U.S. children is the lead-based paint and lead-contaminated dust and soil found in and around old, deteriorating structures. It can also be found in water sources, thus also affecting fish and wildlife. Parents can unknowingly expose their families by bringing lead into the living area, through their hobbies and occupations. The children have contact with lead through their parent's clothes, skin, hair, tools and in their vehicles. Since the ban of adding lead to gasoline and paint in 1978, our communities have been continually paying the price of cleanup efforts and the cost of the health effects it has had on our children. With the safe removal of paint from housing and soil, this will reduce the risk of lead exposure today.

Lead levels, even those less than 10µg/dL can cause hearing loss, IQ decline, impaired growth, learning disabilities, and behavioral problems. Since lead poisoning often occurs with no obvious symptoms, it frequently goes unrecognized. At very high levels, lead poisoning can cause seizures, coma, and even death.

Early symptoms of lead toxicity can include but are not limited to poor growth, headache, weakness, irritability, malaise, stomach cramps/ache, and sleeplessness, loss of appetite, vomiting, and weight loss. Later symptoms can include, but are not limited to abdominal pain, dizziness, pain in joints, staggering, paralysis, convulsion, blindness and loss of motor control.

Lead has several routes of exposure. Ingestion is the primary route for children. Ingestion can be a result of lead contaminated hands, eating paint chips, or through mouthing an object that has exposed lead. It can also be inhaled, through dust and fumes. Although rare, it can also be absorbed through the skin. Due to its sweet taste, lead has been used in cooking, and today is still used in some cultures. It is because of this sweet taste, when a child finds a source, such as a windowsill, they are more likely to return to that sweet taste, thereby increasing the lead level.

Lead is a potent neurotoxin that accumulates in soft tissues and bone over time. Shortly after lead gets into the body it will travel in the blood to the soft tissues- liver, kidneys, lungs, brain, spleen, muscles, and heart. Lead is eliminated in the urine and feces. After several weeks, most lead, if not excreted, will be stored in the bones and teeth. The half-life of lead stored in bone is 3-5 years.

Lead will store at those sites that normally bind calcium, iron and vitamin C. If the body is not getting an adequate supply of these nutrients lead will readily absorb and bind in those empty sites.

A special concern for pregnant women is past bone lead accumulation from an exposure as a child or while in a high risk occupation. The lead may be released into the blood during pregnancy as the body's need for calcium increases. Lead levels as low as 5µd/dL may result in adverse pregnancy outcomes including spontaneous abortion, premature birth, stillbirth, birth defects, and decreased intellect and/or

behavior problems in the child. Simple education measures such as increasing calcium in the diet can help prevent fetal exposure.
Nutritional education plays a key role in decreasing a child's blood lead level. With the increase of calcium, iron, and vitamin C in the diet, lead is more likely to be excreted before absorption. A diet low in fat will help keep the body from retaining lead, as fat stores lead and increases the amount of lead absorbed by the body.

**KRS211.903** refers to testing all high risk children for lead poisoning. All at risk children less than 72 months old should be tested. Medicaid requires all children enrolled in Medicaid or Passport to have a blood lead level drawn at ages 1 and 2, an age where hand to mouth activities are highest. Children living in targeted zip codes, targeted due to the prevalence of older housing, poverty levels of children by zip code and lead poisoning prevalence rates, are also required to have blood lead levels drawn. Follow-up screening can be completed at the Local Health Department or at the primary care physician's (PCP) office. Case management at the local health department collaborates with the family's PCP and offers a family needed services including but not limited to follow-up blood lead levels, family education on what lead is, dietary consults, lead safe home cleaning practices, looking for a source and hand washing. When a child has been identified to have lead poisoning, referrals to the local health department are made for an onsite visual investigation of the home and for a risk assessment where lead samples are taken in and around any structure the child spends 6 or more hours a week, and for renovation safety information.

An educational CD, an example of the Verbal Risk Assessment for screening at risk patients and the CDC Guidelines for the management of children with elevated BLL are enclosed.

If you would like more information, please visit our website at www.putthelidonlead.org. Thank you for your part in ensuring the health of Kentucky's children by educating those who will be their health care providers. Please contact KY CLPPP Program Nurse Consultant, at 502-564-2154 ext. 3859 or Program Coordinator ext. 3527 if you have questions or concerns.

# CDC Recommended Guidelines* for Management of Elevated Blood Lead Levels (BLL) in Children

## BLL <10µg/dL

Repeat BLL in one year if risk factor exists or on Medicaid/Passport.
Refer to Local Health Department for educational resources.
Help family identify possible lead sources at homes, daycare, playgrounds or churches, etc.

## BLL of 10-14 µg/dL

- Repeat blood lead levels every 12 weeks until blood lead level is less than 10µg/dL, then repeat annually until child is 72 months of age if risk factor still exists.
- Contact the local health department for Case Management Services which include family education, referral to nutritional and environmental services, and a home visit as appropriate.

## BLL of 15-44µg/dL

- 15µg/dL and greater is considered Lead Poisoning.
- A **Venous** specimen is considered a confirmed specimen.
- If Capillary, repeat specimen for a confirmation blood lead level within 1 week.
- Medical Evaluation of the child and possible chelation therapy. **With levels of 25 µg/dL or greater, please consult blood Lead specialist** for guidance and/or referral on medical evaluation/ possible chelation therapy.**
    1. Repeat blood lead levels every 1-2 months (Q month if chelated) until blood lead level is less than 10µg/dL for 6 months, then repeat annually if patient has known risk factor Until child is 72 months of age.
- Contact the local health department for Case Management Services which include family education, home visits and referrals to nutritional and environmental services.

## BLL of >45µg/dL

- Venous specimens are considered confirmed specimens, if capillary; a venous specimen should be obtained within **48**˚for levels 45-69 µg/dL, a **STAT** specimen is needed for levels >70µg/dL.
- Medical Evaluation;
- **With levels of 25 µg/dL or greater, please consult blood Lead specialist** for guidance and/or referral on medical evaluation/ possible chelation therapy.**
- Repeat blood lead levels monthly during and post-chelation therapy until blood lead level is less than 10µg/dL for 6 months, then repeat annually if patient has known risk factor until 72 months of age.
- Contact and collaborate with the local health department for Case Management Services which include family education, referral to nutritional and environmental services, and a home visit.

***American Academy of Pediatrics, Committee on Environmental Health. Lead Exposure in Children: Prevention, Detection, and Management. *Pediatrics.* 2005;116 :1036-1046**

****Contact Lead Specialist: Dr. Salvatore Bertolone Nurse Practitioner Diane Burnett 502-629-7750**
**Pediatric Hematology and Oncology Specialist PCS 600 Floyd Street STE 403 Louisville, KY 40202**

We greatly appreciate your assistance. If you have any question, please call the
Childhood Lead Poisoning Prevention Program at (502) 564-2154 X 3859/ 3527 Or fax results to (502) 564-8389.

## CDC Recommended Guidelines* for Blood Lead Levels

# 10-14 µg/dL

- A blood lead level of 10µg/dL is considered level of concern.

- Repeat blood lead levels every 12 weeks until blood lead level is less than 10µg/dL, then repeat annually until child is 72 months of age.

- Contact the local health department for Case Management Services which include family education, home visits and referrals to nutritional and environmental services as appropriate.

***AAP recommends keeping current with the National Advisory Committee on Childhood Lead Poisoning Prevention and any relevant local committees. *American Academy of Pediatrics, Committee on Environmental Health. Lead Exposure in Children: Prevention, Detection, and Management. *Pediatrics.* 2005;116 :1036-1046**

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## CDC Recommended Guidelines* for Blood Lead Levels

# 15-44µg/dL

- A blood lead level of 15µg/dL and greater is considered Lead Poisoning.
- A venous specimen is considered a confirmed specimen, if capillary, repeat a second specimen for a confirmation blood lead level within 1 week.
- Medical Evaluation of the child.

- **With levels of 25 µg/dL or greater, please consult blood Lead specialist** for guidance and/or referral on medical evaluation/ possible chelation therapy.**

- Repeat blood lead levels:

  Every 1-2 months until blood lead level is less than 10µg/dL for 6 months, then repeat annually until 72 months if child has known risk factor.

- Contact and collaborate with the local health department for Case Management Services which include family education, home visits and referrals to nutritional and environmental services to assure lead hazards have been addressed and there are no new hazards.

***AAP recommends keeping current with the National Advisory Committee on Childhood Lead Poisoning Prevention and any relevant local committees. *American Academy of Pediatrics, Committee on Environmental Health. Lead Exposure in Children: Prevention, Detection, and Management. *Pediatrics.* 2005;116 :1036-1046**

****Contact CHFS CLPPP for list of Lead Poisoning Specialists**

****Dr. Salvatore Bertolone**
**Pediatric Hematology and Oncology Specialists PSC**
**600 Floyd Street STE 403 Louisville, KY 40202**
**502-629-7750 Nurse Practitioner: Diane Burnett**

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## CDC Recommended Guidelines* for Blood Lead Levels

# ≥45µg/dL

- Venous specimens are considered confirmed specimens, if capillary; a venous specimen should be obtained within **48**˚for levels 45-69 µg/dL; a **STAT** specimen is needed for levels >70µg/dL.

- **With levels of 25 µg/dL or greater, please consult blood Lead specialist** for guidance and/or referral on medical evaluation/ possible chelation therapy.**

- Repeat blood lead levels monthly during and post-Chelation therapy until blood lead level is less than 10µg/dL for 6 months, then repeat annually.

- Contact and collaborate with the local health department for Case Management Services which include family education, home visits and referrals to nutritional and environmental services to assure lead hazards have been addressed and there are no new hazards.

***AAP recommends keeping current with the National Advisory Committee on Childhood Lead Poisoning Prevention and any relevant local committees. *American Academy of Pediatrics, Committee on Environmental Health. Lead Exposure in Children: Prevention, Detection, and Management. *Pediatrics.* 2005;116 :1036-1046**

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# Medical Assessment and Intervention

| Blood Lead Level (BLL) µg/dL | Elevated blood Lead Level Interventions |
|---|---|
| **≤10 µg/dL** | ▪ **Repeat BLL in one year if any risk factor exists.**<br>▪ **Refer to local health department for educational resources** |
| **10-14 µg/dL** | ▪ **Refer to Local Health Department for:**<br>**1. Lead Education: Dietary**<br>**Environmental**<br>**2. Follow-up BLL's**<br>▪ **Repeat BLL every 12 weeks until BLL is <10µg/dL. Repeat annually if known risk factor exists until 72 months of age.** |
| **≥ 15 µg/dL**<br><br>**PLEASE Consult:**<br>**≥25 µg/dL**** | **Confirm BLL ( venous is confirmed, if capillary, a 2nd capillary)l**<br>**Level 15-44 µg/dL: within 1 week**<br>**Level 45-69 µg/dL: within 48 hours**<br>**Level ≥ 70 µg/dL: STAT**<br>▪ **Repeat BLL: Q 1-2 months until BLL is <10µg/dL for 6 months…**<br>▪ **Refer to Local Health Department for:**<br>**1. Lead Education: Dietary**<br>**Environmental**<br>**2. Follow-Up Blood Lead Monitoring**<br>**3. Environmental Investigation and Lead Hazard Reduction**<br>▪ **Complete history and physical exam**<br>▪ **Lab Work: Hemoglobin or Hematocrit**<br>**Iron Status**<br>**with levels ≥25µg/dL add:**<br>▪ **FEP or ZPP**<br>▪ **Neuro developmental Monitoring**<br>▪ **Abdominal X-ray with Bowel Decontamination if indicated**<br>▪ **Chelation Therapy as indicated, if chelated, monthly BLL's until BLL s <10µg/dL for 6 months, please consult **Lead Specialist.**<br>▪ **Repeat BLL every 12 weeks until BLL is <10µg/dL**<br>**Any confirmed BLL ≥25µg/dL, consult a ** a Lead Specialist for guidance on medical evaluation and possible chelation therapy.** |
| **≥70µg/dL** | **All of the above interventions and:**<br>▪ **Hospitalize and commence Chelation Therapy**<br>▪ **Proceed according to all above interventions**<br>▪ **Retest monthly during chelation therapy** |

****Dr. Salvatore Bertolone//Nurse Practioner: Diane Barnett •• 502-629-7750**
**Pediatric Hematology and Oncology Specialist PSC_•• _600 Floyd Street STE 403 •• Louisville, KY 40202••**
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# CHILDHOOD LEAD SCREENING RECOMMENDATIONS

The American Academy of Pediatrics (AAP) and Centers for Disease Control and Prevention (CDC) recommend that health-care providers use a blood lead test to screen children at ages 1 and 2, and children 25 -72 months of age who have not previously been screened, if they meet one of the following risk factor criteria:

- Any Child who receives services from public assistance programs, such as **Medicaid** or the Supplemental Food Program for Women, Infants, and Children (WIC) must be tested with blood lead levels (per CMS Regulation)
- Child resides in one of the zip codes in the 'Targeted Zip Codes' enclosure.
- Child's parent/guardian answers "Yes" or "Don't know" to any question on the enclosed 'Verbal Lead Risk Assessment' questionnaire.

**Targeted Zip Codes**

| **Adair** | | **Breckinridge** | | **Edmonson** | | **Graves** | | **Henry** |
|---|---|---|---|---|---|---|---|---|
| 42715 | | 40170 | | 42275 | | 42040 | | 40007 |
| 42742 | | | | 42285 | | 42061 | | 40058 |
| 42761 | | **Calloway** | | | | | | |
| | | 42076 | | **Elliott** | | **Grayson** | | **Hopkins** |
| **Allen** | | | | 41171 | | 42762 | | 42408 |
| 42153 | | **Campbell** | | | | | | 42410 |
| | | 41071 | | **Estill** | | **Green** | | |
| **Ballard** | | 41073 | | 40336 | | 42743 | | **Jackson** |
| 42060 | | 41074 | | 40472 | | | | 40447 |
| | | 41085 | | | | **Greenup** | | 40486 |
| **Barren** | | | | **Fayette** | | 41174 | | |
| 42160 | | **Carlisle** | | 40508 | | | | **Jefferson** |
| | | 42021 | | | | **Hardin** | | 40202 |
| | | 42023 | | **Fleming** | | 40155 | | 40203 |
| **Bath** | | | | 41049 | | 40177 | | 40204 |
| 40374 | | **Carter** | | | | | | 40205 |
| | | 41146 | | **Floyd** | | **Harlan** | | 40206 |
| **Bell** | | | | 41605 | | 40801 | | 40208 |
| 40845 | | **Casey** | | 41606 | | 40807 | | 40209 |
| 40902 | | 42528 | | 41607 | | 40810 | | 40210 |
| 40958 | | 42539 | | 41612 | | 40815 | | 40211 |
| 40977 | | | | 41615 | | 40819 | | 40212 |
| 40988 | | **Christian** | | 41619 | | 40820 | | 40213 |
| | | 42266 | | 41630 | | 40823 | | 40215 |
| **Bourbon** | | 42254 | | 41635 | | 40828 | | 40217 |
| 40348 | | | | 41636 | | 40830 | | **Johnson** |
| 40361 | | **Clay** | | 41640 | | 40831 | | 41216 |
| | | 40914 | | 41649 | | 40843 | | 41219 |
| **Boyd** | | 40941 | | 41650 | | 40854 | | 41222 |
| 41101 | | 40972 | | 41651 | | 40855 | | 41228 |
| | | 40983 | | 41653 | | 40863 | | 41238 |
| **Bracken** | | | | 41660 | | 40870 | | 41240 |
| 41002 | | **Clinton** | | 41666 | | 40873 | | 41254 |
| 41004 | | 42602 | | 41669 | | **Hart** | | 41255 |
| **Breathitt** | | **Crittenden** | | **Fulton** | | 42722 | | 41257 |
| 41317 | | 42064 | | 42041 | | 42729 | | 41260 |
| 41339 | | | | 42050 | | 42749 | | 41263 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 41385 | | **Cumberland** | | | | | | 41265 |
| | | 42759 | | **Garrard** | | **Hickman** | | 41268 |
| | | | | 40461 | | 42031 | | 41274 |
| **Kenton** | | **Lee** | | **Magoffin** | | **Muhlenberg** | | **Pike** |
| 41011 | | 41311 | | 41426 | | 42374 | | 41514 |
| 41014 | | 41397 | | 41464 | | 42321 | | 41524 |
| 41015 | | | | 41465 | | 42332 | | 41543 |
| 41016 | | **Letcher** | | 41632 | | 42339 | | 41546 |
| | | 40826 | | | | | | 41549 |
| **Knott** | | 40862 | | **Martin** | | **Ohio** | | 41553 |
| 41740 | | 41537 | | 41203 | | 42333 | | 41555 |
| 41822 | | 41819 | | 41224 | | 42338 | | 41563 |
| 41843 | | 41825 | | 41250 | | 42343 | | 41564 |
| 41844 | | 41826 | | 41262 | | 42369 | | 41567 |
| 41759 | | 41833 | | 41267 | | | | 41569 |
| 41772 | | 41835 | | | | **Owen** | | |
| 41817 | | 41855 | | **Mason** | | 40355 | | **Todd** |
| 41834 | | 41810 | | 41055 | | | | 42204 |
| 41839 | | 41840 | | 41056 | | **Owsley** | | |
| 41859 | | 41845 | | | | 41314 | | **Warren** |
| | | 41849 | | **Meade** | | 41364 | | 42170 |
| **Knox** | | | | 40104 | | 41386 | | |
| 40734 | | **Lewis** | | 40176 | | | | **Wayne** |
| 40771 | | 41135 | | | | **Pulaski** | | 42633 |
| 40903 | | 41170 | | **Menifee** | | 42501 | | 42632 |
| 40906 | | 41179 | | 40322 | | 42544 | | |
| 40935 | | | | 40346 | | 42553 | | **Webster** |
| 40953 | | **Lincoln** | | 40387 | | | | 42450 |
| 40982 | | 40448 | | | | **Wayne** | | 42463 |
| 40995 | | | | **Mercer** | | 42633 | | 42403 |
| 40997 | | **Livingston** | | 40310 | | 42632 | | |
| | | 42047 | | | | | | **Whitley** |
| **Lawrence** | | | | **Metcalf** | | **Perry** | | 40759 |
| 41124 | | **Logan** | | 42129 | | 41367 | | 40763 |
| 41159 | | 42265 | | 42154 | | 41701 | | 40769 |
| 41230 | | | | | | 41712 | | |
| | | **McCreary** | | **Monroe** | | 41723 | | **Wolfe** |
| **Leslie** | | 42647 | | 42167 | | 41778 | | 41301 |
| 40827 | | 42653 | | 42157 | | 41735 | | 41332 |
| 40858 | | 42638 | | 42140 | | 41751 | | 41365 |
| 40874 | | | | | | 41773 | | |
| 41714 | | **McLean** | | **Morgan** | | | | |
| 41730 | | 42371 | | 41408 | | **Robertson** | | |
| 41762 | | | | 41421 | | 41064 | | |
| 41775 | | **Marion** | | 41425 | | | | |
| 41776 | | 40009 | | **Nelson** | | **Rowan** | | |
| | | 40328 | | 40008 | | 40313 | | |

## LEAD Verbal Risk Assessment Questionnaire

- **Does the patient live in or visit a building built before 1978, with peeling/chipping paint or with ongoing renovation (dust)???**
- **Does the patient have someone close to you (at work/ home/church/school) that has or has had lead poisoning or an elevated blood lead level?**
- **Does the patient or a family member (who visits or the child visits or lives with you) work in an occupation or participate in a hobby that may contain lead?**

| | | |
|---|---|---|
| Auto mechanics/bodywork | Plumbing | |
| Farm/Migrant Farm Work | Blowing Glass | Jewelry Making/Repair |
| Furniture Refinishing | Gardening | Metal Sculpting |
| Renovation Work | Painting | Stained Glass |
| Painting Roads | Printing | Car/Boat repair |
| Metal Work/Welding | Casting Aluminum | Firing Ranges |
| Plastics manufacturing | Ceramic Making | Firearms/Firing Range |
| Radiator Repair | | Battery Recycling/Smelting/Recycling |
| Making Bullets/Sinkers/lead toys | High Construction Area | Electronic soldering |
| Home Repairs/Remodeling | Bridge Repair/Painting | Smelting Metals/ Scrap yards |

- **Does the patient use folk remedies, cosmetics or use old painted pottery to store food?**

**IMPORTED COSMETICS: ▪ Middle East, India, Pakistan, Africa ▪** Kohl, Surma, Al Koh: a powder used both as a cosmetic eye make-up and applied to skin infections and the navel of a newborn child. And can be ingested when on hands ▪ Kajal: eye cosmetic when used can be ingested if on hands.
▪ Sindoor: a powder applied to face or scalp during ceremonies, mistakenly used as food
**FOODS: ▪ Middle East: ▪** Lozeena: a bright orange powder used by Iraqis to color rice and meat**▪ Mexico ▪** Tamarind Candy: gel like candy made with chilies, and placed in little pots to eat with little spoons, with the candy, wrappers and pots have been identified with having high lead levels ▪ Chapulines (dried grasshoppers): can be chocolate coated; grasshoppers eat chilies that are contaminated with lead from soil and area silver mine fallout
**FOLK REMEDIES: ▪ Hispanic ▪** Azarcon aka: Ruedo, Corol, Maria Luiso, Alarcon, Ligo: used for intestinal illness. **▪ Mexico ▪** Greta: a yellow powder used for intestinal illness. **▪ Dominican Republic ▪▪** Litargirio: yellow peach powder used as a deodorant, foot fungicide, treatment for burns and wound healing**. ▪ Vietnam/ Hmong Community ▪** Pay-loo-ah- a red powder given for rash or fever. **▪ Asian/ Tibet/ India/Thailand ▪** Ayurvedic medicine, ▪ Tibetan Herbal Vitamin **▪ China▪** Jin Bu Huan: used to relieve pain, ▪Po Ying Tan: used to treat minor ailments in children, ▪ Ba-Baw-San. **▪ India ▪** Ghasard: a brown powder given as an aid to digestion. ▪Thailand▪ Daw Tway is a digestive aid used in Thailand and Myanmar (Burma). **▪ Iran ▪** Bint Al Zahab: Rock ground into a powder and mixed with honey and butter given to newborn babies for colic and early passage of meconium after birth. **▪ Saudi Arabia ▪** Traditional Saudi Medicine: Orange powder prescribed by a traditional medicine practitioner for teething; also has an antidiarrheal effect, ▪Santrinj: An amorphous red powder containing 98% lead oxide used principally as a primer for paint for metallic surfaces, but also as a home remedy for "gum boils" and "teething."▪ Bint Dahab: A yellow lead oxide used by local jewelers and as a home remedy, **▪ Kuwait ▪** Bokhoor: A traditional practice of burning wood and lead sulphide to produce pleasant fumes to calm infants.
**Other: ▪**Bala Goli: a round, flat, black bean dissolved in 'gripe water' and used for stomach ache. ▪Kandu: a red powder used to treat stomach ache.

**Does the patient live near a busy road/ highway?**

Soil around your home could be contaminated by the leaded gasoline fallout, on your soil or in water (cisterns/wells) for many years following contamination and can get on your child's hands. Lead can also

be absorbed in fast growing plants such as Kale, spinach, and other garden vegetables from the soil and then consumed by animals and humans and can lead to increase in blood lead levels.